IES

ECOfOCUS

INSTITUTE OF ECOSYSTEM STUDIES

understanding our natural world

spring 2007

Charlie Canham

THE FATE OF ADIRONDACK LAKES

In New York's Adirondack State Park, over 3,000 lakes and ponds dot the landscape. In many ways, the water within their shorelines is tied to the forests that abut them. Are the forests young or old? Are they growing on sandy soil or bedrock? And, perhaps most importantly, can they filter out pollutants?

The Adirondack Park covers more than six million acres, making it the largest state or federal park in the contiguous United States. It has the misfortune, however, of being downwind from a number of major Midwestern power facilities. As a result of geography, these coal-burning plants send the park a steady supply of nitrogen pollution.

It has been well documented that excess nitrate can cause freshwater acidification. IES Forest Ecologist Dr. Charles Canham and Aquatic Ecologist Dr. Michael Pace are interested in revealing if nitrogen, as a nutrient, could also pose a threat to Adirondack Park lakes. These lakes are among the last low-nutrient crystal-clear fresh waters in the U.S.; nitrogen enrichment could condemn them to a future of algal growth and reduced water clarity.

Forests can serve as important filters for nitrogen, minimizing the amount that reaches nearby lakes. Canham and Pace hypothesize that atmospheric nitrogen loads are exceeding the forest's ability to filter watershed outputs, leading to nitrogen-loading in adjacent water bodies. Exploring the link between lake chemistry and wetland configuration is a daunting task; researchers are faced with a huge research site and hundreds of remote lakes that are difficult to access.

Armed with the Adirondack Park Agency's watershed data, Canham and colleagues set out to gather water samples from 212 representative lakes. Collecting these samples required time, persistence, and ingenuity. The latter came in the form of Ed McNeil, an engineer and committed environmentalist who built and retrofitted a 28-foot float plane for lake sampling. McNeil's support for the project— donating the use of his plane, serving as pilot, and providing field sampling funds— was critical in getting it off the ground.

> "Forests can serve as important filters for nitrogen, minimizing the amount that reaches adjacent lakes."

Canham and McNeil spent the summer of 2006 gathering samples. These data are being used to fuel computer models that will help analyze nitrogen inputs, wetland buffering capacity, and the fate of the Adirondack Park lakes. Preliminary tests have revealed that many of the sampled lakes are being stressed by nitrogen inputs, especially those on the park's western side.

The duo will take to the air again this summer, expanding the study to include another 200 lakes. This information will strengthen the models being used to help reveal what is happening in the region.

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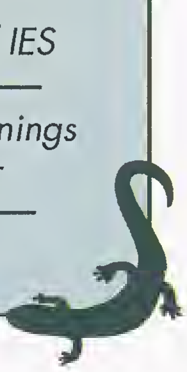

ECO*f*OCUS

Ecofocus is published by the Institute of Ecosystem Studies, a not-for-profit organization dedicated to understanding the natural world. Our community of over 120 scientists, educators, and support staff is investigating the ways that air, water, soil, plants, and animals interact. IES research is critical to environmental management, from how invasive species impact the Hudson River to the effects of pollutants on air quality.

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FROM OUR PRESIDENT

HO Photographers of Hanover, NH

> "BY ENGAGING IN CIVIC DUTIES AND MAKING SENSIBLE PERSONAL CHOICES, ENGAGED CITIZENS CAN PLAY A CRITICAL ROLE IN PROTECTING THE ECOSYSTEMS THAT SUPPORT LIFE."

The winds of change are blowing at IES. May 28th will be my last day as Director and President; on the 29th Dr. William H. Schlesinger will assume leadership of the Institute. Since founding the organization in 1983, I am extremely proud of what we have built and the difference we have made in both understanding and protecting natural ecosystems.

This is the debut issue of ECOfOCUS, which will replace the former IES Newsletter. I am delighted to introduce the new format to you. ECOfOCUS will be published three times a year.

The cover story on Adirondack Park lakes showcases one of the many ways that donors help make IES research possible. Ed McNeil's professional background is in engineering and development. His desire to give back motivated him to develop a creative solution for remote lake sampling. When asked about his support, he modestly replied, "The longer that we're on the planet, the more you realize you have to give something back." I couldn't agree more.

Education at all levels is something that the Institute takes very seriously. While we operate outside of a conventional university setting, we are committed to reaching out to the next generation of ecologists. This is done in a range of ways, from undergraduate research experiences and post-doctoral training to on-site courses for graduate students. The future of ecology is strengthened by these bridges to the next generation.

Ecological stewardship relies on an appreciation of the natural world. Not everyone is slated to become a professional ecologist, and that's okay. Engaged citizens play a critical role in protecting the ecosystems that support life. I invite the public to attend our Friday lecture series, our family-oriented Weekend Education Programs, and other special events. See the calendar on page 7 to stay involved.

I leave my leadership role with great optimism and confidence about IES and its future.

Gene Likens

Dr. Gene E. Likens
President & Director

24 YEARS OF LEADERSHIP

FORGING A MAJOR CENTER FOR ECOLOGY

Five key questions for the Institute's founding director

For almost a quarter of a century, Dr. Gene E. Likens has focused on one overriding goal, fostering excellence in his staff. From the moment he took the helm of the Institute in 1983, he had a simple and steadfast plan: hire the brightest people possible and encourage them to blossom professionally. This philosophy, coupled with a dedication to education and collaboration, has helped the organization emerge as one of the world's leading centers for ecological research.

Looking back on your years as president, what has been your most satisfying achievement?
Nurturing the organization to the point it is at today, strong and vibrant. During my tenure, IES has grown from an almost invisible entity to one with international recognition. Our facilities have also grown, but the most rewarding aspect has been seeing the growth in the organization's most vital resource, its people. Without a committed and talented staff, our ascent wouldn't have been possible.

What has been your greatest leadership challenge?
Maintaining and increasing funding for our programs, so that they could have greater impact. Long-term research is critical to understanding and addressing the complex environmental problems we face today. Unfortunately, over the years, funding for such projects has become more and more difficult to secure. This is a shame, because good environmental decision making relies heavily on long-term ecological research.

Papers authored by IES are incredibly influential in the field of ecology. How did you assemble such a strong group of thinkers?
By conducting rigorous international searches and hiring the best people possible. The community that I've nurtured here at IES places a high value on academic freedom, the strength of individual ideas, and the importance of collaboration. I believe that a commitment to these three ideals has helped strengthen both staff productivity and the Institute as a whole.

What do you see in the future for IES?
I see a very bright future. Our administrative, technical, and support staff are productive and dedicated and they share a positive esprit de corps. These are vital ingredients for success under new leadership. In the coming years, the organization is poised to make greater inroads in connecting its impressive scientific output with broader audiences, such as land managers and policy makers.

What will you be doing next?
Building IES has been my passion for over two decades. In the coming years, I look forward to focusing my attention on my long-term research projects at Hubbard Brook, collaborating with international colleagues, and, whenever possible, teaching the next generation of ecological thinkers.

Lori Quillen

Likens reading excerpts from Aldo Leopold's *A Sand County Almanac* at a party honoring the environmentalist's 100th birthday.

LAYING THE FOUNDATION

Over the past twenty-four years, the Institute has grown from a concept into an internationally recognized leader in the field of ecosystem science. Much of the organization's success can be traced to the dedication and nurturing of its founding director, Dr. Gene E. Likens. When he steps down from his post this June, the strong foundation he laid for the Institute will help propel it into the future.

A list of his directorial accomplishments include:

◆Appointing the first IES Board of Trustees in 1993

◆Building a $90 million endowment

◆Assembling one of the world's most influential ecological research groups

◆Initiating and sustaining the Cary Conference series, an international forum on emerging topics in ecology

◆Improving the Institute's research and education infrastructure, including the building of the IES Auditorium and the Gene E. Likens Laboratory and expansions to the Plant Science Building

◆Establishing a strong platform for graduate and post-doctoral research training at IES

◆Overseeing the creation of the IES Gifford Perennial Garden and Fern Glen

◆Launching the IES Greening Initiative

SPOTLIGHTS

SCHLESINGER NAMED NEXT IES PRESIDENT

DEAN OF DUKE'S NICHOLAS SCHOOL TO BECOME IES PRESIDENT IN MAY 2007

Jim Wallace, Duke University Photography

The IES Board of Trustees has named Dr. William H. Schlesinger the next President of the Institute of Ecosystem Studies. He will assume the post in May of 2007. Upon accepting the position, Dr. Schlesinger noted, "Institute research is critical to both the field of ecosystem science and the protection of Earth's natural systems. I look forward to building on the Institute's research success while forging connections among IES science and policy makers, educators, and the general public."

Since 2001, Schlesinger has been the Dean of Duke University's Nicholas School of the Environment and Earth Sciences. He began his career at Duke in 1980, was awarded the prestigious James B. Duke Professorship of Biogeochemistry in 1994, and oversaw Duke's ecology graduate program from 1999 to 2002. His research has taken him from the Mojave Desert of California to Okefenokee Swamp in southern Georgia.

The IES community looks forward to working with Dr. Schlesinger in the coming months. Interested in learning more about our future President? Look for a Q & A in the next issue of ECOfOCUS.

PROPERTY OWNER INVESTS IN ECOLOGY

Architect Allan Shope has pledged $75,000 over the next five years to fund research on pearly mussels. Funding will support long-term research being conducted in the Webatuck Creek by IES Freshwater Ecologist Dr. David L. Strayer. The creek, which intersects Shope's property, is home to a population of the frequently misunderstood animals.

With nearly 300 different species, North America is a hotbed for pearly mussel diversity. The long-lived animals (up to 150 years) can reveal a world of information about the freshwater habitats they live in. Once abundant, mussels have been disappearing from the landscape, leaving ecologists in a race to understand what their absence will mean for the functioning of freshwater ecosystems.

Lori Quillen

(L-R) Julie Shope, Dave Strayer, and Allan Shope on the grounds of Listening Rock Farm

Few landowners are tuned in to the mussels living in their backyard, but Shope is not your typical landowner. An avid learner, his passion for nature is reflected in the Aldo Leopold quotes on his barn's walls. He became interested in the animals when Strayer requested permission to work on his site. After viewing video clips of the mussel's fascinating reproductive cycle, and learning that the average age of his residents was over 65, Shope was hooked. Strayer's work will investigate why young mussels are so elusive.

INSTITUTE CONFERENCE TO FOCUS ON ECOLOGICAL DESIGN

The air we breathe and the water we drink are directly shaped by the built landscape surrounding us. Things like the slope of a roof, the placement of a collection of buildings, or green spaces in-between buildings can have a strong influence on the way that the urban ecosystem functions. This landscape — a vision imagined by designers and architects — can be constructed in a way that both acknowledges and preserves the environment it is part of.

In May of 2007, the Institute of Ecosystem Studies' twelfth biennial Cary Conference will focus on how the urban design community can incorporate ecological principles into the way that urban areas are developed. The invited attendees will include some of our nation's foremost ecologists, urban designers, architects, and landscape architects. The conference's main goal is to share expertise in a way that supports sustainable and resilient urban design.

Conference proceedings will form the basis of both a book and a website. These end-products will be used to connect conference recommendations with the larger community of ecologists and designers. Proceedings will also be used to help the next generation of urban planners embrace a greener urban vision.

WHERE WE WORK

NOTES FROM THE FIELD

DR. STUART E. G. FINDLAY, IES AQUATIC ECOLOGIST

SUBMERGED AQUATIC VEGETATION & THE HUDSON RIVER

For over twenty years, the Hudson River has been one of my primary research sites. With several IES colleagues, one of my ongoing projects explores the ecological importance of submerged aquatic vegetation (SAV). These rooted underwater vascular plants, such as water celery, provide critical habitat for a range of river life, including commercial and recreational fish species.

Relative to open water habitat, SAV beds are home to a greater diversity of fish species. Human activity is one of the biggest threats to these beneficial plants. Boaters damage beds, often inadvertently, when motor-propelled crafts cruise over plants during high tide. During this period, plants are not visible on the water's surface, but they are prone to propeller damage.

Submerged plants provide more than structural habitat. In tidal areas of the river, from the Battery in Manhattan to the Troy Lock, native SAV plays an important role in oxygenating the water. I specify "native" because the river is also home to large beds of an invasive aquatic plant called water chestnut. Unlike water celery, these beds remove oxygen from tidal waters. Water chestnut's floating leaves blanket the surface of the water, blocking out sunlight and preventing underwater photosynthesis.

My research is exploring differences in native versus invasive SAV beds, the distribution of SAV beds in the river, and the conditions that regulate healthy beds of native SAV. Findings will help inform river-wide protection and restoration efforts.

Kara Goodwin

A collaborative IES research team has been conducting long-term studies on the Hudson River for over two decades. To learn more about the Hudson River Ecosystem Study, visit www.ecostudies.org/IES_hudson_river.html

FROM THE GROUNDS OF IES

BRAD ROELLER
IES GROUNDS MANAGER

LANDSCAPING WITH DEER

It is no coincidence that it takes four letters to spell "deer." While some consider them magnificent animals, without constant vigilance they can quickly destroy landscape plantings.

Northeast deer densities are at the highest levels ever recorded. Biologists estimate that there are over 3 million deer, with densities in the mid-Hudson Valley averaging 45 deer per square mile. In suburban areas, numbers can approach 200 deer per square mile.

Deer impact our lives in a myriad of ways. They are vectors for livestock and tick-borne diseases and they cause crop loss. Forest ecologists have found that when there are more than 15 to 20 deer per square mile, important forest plant species stop regenerating.

Each year, deer damage over 10 million dollars worth of landscape plantings in New York State. One-third of households are affected. Homeowners typically respond by purchasing a repellent or erecting a deer-proof fence. Others rely on various gadgets to drive deer away. What works the best?

There is no simple answer; deer are complex connoisseurs. Environmental and biological factors influence what they eat and how often they eat it. After evaluating dozens of deer deterrents, I have learned to expect the unexpected. Over 33 years of gardening on IES grounds has taught me a few important lessons.

The first line of defense is to use deer-resistant plants in your landscape. Front potentially attractive flower beds with plants that are unappealing to the ungulate palate. Careful planting is more effective than deterrents and gadgets, which lose their effectiveness as deer become familiar with them. You don't want to break a browsing habit, you want to prevent one from forming.

When using repellents, persistence is key. By routinely applying repellents to susceptible plants, you can "pattern" deer off your property. Be aware that even the best repellents can fail when faced with summertime drought, low acorn production, persistent snow cover, or high deer densities.

For more information on landscaping with deer (and other wildlife) visit the IES website: www.ecostudies.org/gardening_tips.html.

DEVELOPMENT

DEVELOPMENT OFFICE CORNER

Dear Friends,

Since coming on board in 2006, I have been impressed by the support provided by the Institute's Aldo Leopold Society members. Your dedication is evident in the personal and financial capital you invest in IES. Being green-minded isn't always easy, but it's almost always right, and that's something you understand.

Our members-only events, from Autumn Glory and the Garden Luncheon to dinner or cocktails with the president, have been an absolute pleasure to host. Conversation is never lacking; I am sure that is because we share a common passion, learning about the natural world. Be sure to mark your calendars for our annual Garden Luncheon this June.

As the year unfolds, I look forward to strengthening ties with each of you, welcoming new members, and increasing overall awareness of IES and the Aldo Leopold Society. Now, more than ever, we need private individuals who recognize the importance of IES research. If we are to protect this great world, we need to value the scientists who illuminate our understanding of it.

Interested in joining the Aldo Leopold Society? Don't hesitate to contact me directly at (845) 677-7600 x120 or e-mail salsbergd@ecostudies.org.

All the best,

Diana Salsberg
IES Development Officer

Pamela Freeman

Millbrook business owners Mr. Robert Whaley of Abbot Smith & Associates (left) and Mr. John Bruno of Oak Summit Vineyard (right) were thanked for their support by IES President Dr. Gene E. Likens (center) at this winter's annual Business and Community Leaders Breakfast. Hosted by Dr. Likens, the breakfast took place in the Institute's tropical greenhouse. Invitees were provided with insight into the organization's facility Greening Initiative as well as a new education endeavor. At the breakfast, participants were given the opportunity to support the Institute's Greening Initiative by purchasing tax-deductible CO_2 credits. The credits will help IES invest in green energy solutions. For information on how you can play a role in reducing local carbon emissions, visit: www.ecostudies.org/CO2_credits.html.

The event was made possible through the generosity of Reardon Briggs Co. Inc, The Bank of Millbrook, Mr. Arthur L. Gellert, and Mr. Eugene Fleischman. Interested in being invited to next year's breakfast? Contact Vicki Doyle at (845) 677-7600 x233 or e-mail doylev@ecostudies.org.

Looking for a tranquil respite?

Take a tropical adventure in the IES Greenhouse. The facility is free and open to the public year round, from 9 a.m. to 3:30 p.m. (excluding major holidays).

Lori Quillen

CALENDAR

Ecology Camp Junior Counselors

Interested in spending a week helping young campers investigate IES? Consider becoming a volunteer junior counselor in our Ecology Day Camp. Open to students entering grades 8-12. Contact Kim Notin at (845) 677-7600 x303 or notink@ecostudies.org

Free Weekend Education Programs

Offered monthly, our weekend education programs are geared toward families and the general public. For information on upcoming events, visit www.ecostudies.org/public.html

April 14: Interpreting the Magical Music of Spring's Frogs
April 29: Earth Day Event: The State of the Hudson Valley
May 26: Woody and Herbaceous Landscape Plants
June 23: Butterflies and Habitats

Global Warming Panel

April 19, 6 p.m. to 8 p.m., IES Auditorium
IES scientists and educators will address questions about this pressing environmental issue, including information on what you can do to reduce your CO_2 footprint.

Free Friday Scientific Seminars

Seminars are held at 11 a.m. in the IES auditorium from September until early May.

March 30: "Cyclic dynamics of leptospirosis in California sea lions" Dr. James Lloyd-Smith, Center for Infectious Disease Dynamics, Penn State University

April 6: "Tracing the biogeochemical cycling of silica" Dr. Louis Derry, Cornell University

April 20: "Can ecosystem services save conservation from being a bit-player on the global agenda?" Dr. Peter Koreiva, The Nature Conservancy

April 27: "Strategies for increasing the chances that environmental decision-making is guided by sound science" Dr. David Hort, University of Maine

Save the Date!
IES Spring Plant Sale
May 18, 19, & 20
For more information, call (845) 677-7600 x300

IES Continuing Education

The Continuing Education Program is accepting registrations. For information or to request a brochure, call (845) 677-9643 or visit: www.ecostudies.org/education/continuing.html.

Upcoming courses include:

May 19: Summer Container Gardens
May 20: Spring Wild Plant ID
May 30: Wetland Restoration
June 2: Shrub Walk
June 2: Native Plants
June 10: Weed Walk
June 10: Gardening to Attract Birds
June 23: Landscapes of the Hudson Valley
June 24: Fern Identification
May 5: Drawing Flowers and Plants in Their Natural Habitat

Interested in learning about upcoming IES events via e-mail? Join our e-mail distribution list by sending your address to freemanp@ecostudies.org

Ways to Support the Institute

The Institute offers two membership levels. **General members** receive an EcoFocus subscription, notification when IES holds open lectures and events, and enrollment in a reciprocal admission program. **Aldo Leopold Society Members** are a special part of the IES family. Exclusive Aldo privileges include access to invitation-only lectures, galas, science updates, and dinner parties.

General Membership

☐ $50 Individual
☐ $60 Family
☐ $100 Sponsor
☐ $250 Club/School

Aldo Leopold Society Membership

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For research, graduate opportunities, administration, library, volunteer opportunities, and general information:

IES Plant Science Building/IES Auditorium
Box AB (65 Sharon Turnpike)
Millbrook, NY 12545
Tel: (845) 677-5343 • Fax: (845) 677-5976

For school programs, ecology day camp, REU/RET inquiries, and the Gifford Garden:

IES Education Office/Gifford Garden
Box R (181 Sharon Turnpike)
Millbrook, NY 12545
Tel: (845) 677-5359 • Fax: (845) 677-6455

For those interested in visiting our tropical greenhouse:

IES Greenhouse
4799 Route 82
Salt Point, NY 12578
Tel: (845) 677-5354

COME VISIT US!

We welcome visitors to our Millbrook, NY campus. Located on nearly 2,000 acres, the campus features rolling hills, old fields, wetlands, gardens, and a tropical greenhouse. Our hiking trails and display gardens are open for the season, April 1st - October 31st (Mon-Sat, 9 a.m. to 6 p.m.; Sun, 11 a.m. to 6 p.m.) and our tropical greenhouse is open year-round, seven days a week (9 a.m. to 3:30 p.m.). Free and open to the public, the greenhouse contains over 1,300 plant species. Plant pests are managed using beneficial insects, not chemicals. A sampling of the collection includes succulents, scented geraniums, coleus, carnivorous plants, kitchen herbs, and prehistoric plants. For more information, visit: www.ecostudies.org

Pamela Freeman

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